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CANTON CHRISTIAN COLLEGE

AGRICULTURAL BULLETIN No. 4

A GARDEN GUIDE

FOR

SOUTH CHINA

BY

WALTER LEON FUNKHOUSER

CANTON, CHINA
1922.

CANTON CHRISTIAN COLLEGE

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CONTENTS

page

Introduction....1

Acknowledgements....2

General Requirements....3

Suitable Soils and How to Improve Them....3

Drainage....4

Trenching and Digging....4

Watering and Irrigating....5

Mulching....6

Manuring....7

Compost Heap....8

Liquid manure....8

Green Manure....9

Weeding....9

Frames and Shelters....9

Necessary Tools....10

Paper Pots....10

Garden Pests

Aphis....11

Crickets, Beetles, Grasshoppers....11

Cabbage-fly and Caterpillar....11

Cut Worms....11

Mildew, Rust and Other Fungus Diseases....12

Scale....12

Snails and Slugs....12

Sweet Pea Mite and Pea Spot....12

Tomato Wilt....13

Bean Wilt....13

Garden Pest Remedies

Bordeaux Mixture 14

Kerosene Emulsion 14

Paris Green 14

Tobacco Water 15

Lime-Sulphur 15

Vegetable Garden

General Arrangement 16

Raising Seedings 16

Transplanting 18

Rotation of Crops 19

Fallowing 19

Vegetable Calendar 20

Asparagus 21

Beans 22

Beets 23

Swiss Chard (Silver or Spinach Beet) 24

Borecole, Scotch Kale or Curly Greens 24

Brocolli 24

Brussels Sprouts 24

Cabbage 25

Capsicum or Peppers 25

Carrot 25

Cape Gooseberry 26

Cauliflower 27

Celery 27

Corn, Sweet 28

Cress and Mustard 29

Cucumbers....29
Egg Plant....30
Endive....30
Kohl Rabi....30
Lettuce....31
Melon....32
Onions....32
Parsley....33
Pea....33
Rhubarb....33
Radish....34
Spinach....34
Tomatoes....34
Turnips....35

Flower Garden

Raising Flowers from Seeds....36
Marking Seed Beds....38
Planting and Transplanting....39
Layering....39
Cuttings....39
Calendar for Planting Flower Seeds....41
Ageratum....42
Amaranthus....42
Antirrhinum (Snapdragons)....43
Asters....43
Balsam (Touch-me-nots, or Lady Slipper)....43
Calendula (Pot Marigold)....44
Candytuft....44

Calliopsis (Coreopsis) 44
Canna 44
Carnation 45
Celosia 45
Chrysanthemum 45
Clarkia 46
Cosmos 46
Delphinium (Larkspur) 47
Dianthus (Pink) 47
Helichrysum (Everlasting) 47
Heliotrope 47
Lupins 48
Marigold 48
Mignonette 48
Nasturtium 48
Pansies 48
Phlox Drummondii 49
Poppy 49
Roses 49
Sunflower 51
Sweet Peas 51
Verbenas 52
Violets 52
Zinnia 53

Ornamental and Forest Trees

Selecting the Site for Nursery 53
Plan of the Nursery 54
Fences 54

Preparation of the Soil.....54
Irrigation 55
Sowing the seeds.....55
Shading.....55
Weeding.....56
Transplanting.....56
Pruning 57
Stem Cuttings 58
Air Layering.....58
Fertilizing the nursery.....59
Collecting native seeds.....59
Identifying trees.....59
Trees to grow.....59

INTRODUCTION

The purpose of this bulletin is to sum up in as simple a way as possible the fundamentals of gardening in South China, especially in those regions having a climate similar to that of Canton, and to make it possible for people with no technical training in agriculture to have successful gardens. In serving this purpose it is believed that a real contribution will have been made to the health and happiness of the people of this region.

It is not intended to give the impression that all the problems of the gardener have been solved. Many have not yet even been studied systematically, but rather it is desired to pass on the results of our experience here at the Agricultural College of Canton Christian College, and that of gardeners in similar climates elsewhere.

In the same way it is not meant that only those varieties of vegetables and flowers definitely mentioned here or in our seed catalogue can be grown successfully in South China. Many other varieties or kinds of flowers and vegetables have never been tried here, but all of those so listed are standard sorts and in most cases have been successfully grown on our farm.

We shall appreciate receiving information from you as to the kinds you find most successful, and in what way you find them superior. Should you encounter any difficulties about which you would like further advice than that given herewith we will be very glad to help you in any way we can.

Acknowledgements

It is desired to acknowledge help received from Yate's "Garden Guide", Suttons' "Vegetables and Flowers from Seeds in Tropical and Semi-Tropical and Temperate Climates" and Watts' "Vegetable Gardening," in the preparation of this bulletin. Helpful criticism and corrections have been made by Prof. G. W. Groff, Mr. P. K. Fu, Mr. Yuen Hon Pong, Dr. J. C. Griggs, and Prof. C. O. Levine, College of Agriculture, Canton Christian College.

GENERAL REQUIREMENTS

Suitable Soils and How to Improve Them

The best soil is a deep, light, friable loam, but any ordinary soil can be made satisfactory with care and attention. Very heavy clay land should be dressed with air slaked lime at the rate of about one pound per square yard; a good dressing of ashes, old mortar or sand, may also be applied with advantage. The chief reason that many soils in South China bake hard when dried is their lack of organic matter, under which condition even a fairly sandy soil becomes a difficult one to handle. This trouble can be helped by any method that will add decayed organic matter to the soil. Continual dressings of stable manure will lighten the soil in a few seasons and the heavier the applications the sooner the beneficial results will be observed. Where stable manure is not available the next best method is the use of composted weeds, straw, grass, etc. Where neither of these methods is possible the growing of green manure crops may be resorted to, though in general they are not advisable if any other method can be used. The reason is seen when the term green manure is understood. A green manure is any crop grown and plowed under simply for the sake of adding organic matter to the soil. Hence no return can be expected from the land while the green manure crop is being grown.

A second cause of soils baking hard when dry is the practice of working in the field when the soil is wet. The harmful results increase in proportion to the amouut of clay in the soil. Soil once worked when too wet will be lumpy and difficult to work for at least one year. If, by any chance, this mistake has been made the damage can be partially repaired by plowing or digging at a time when there is no crop to be grown and not

working it down, but letting the field lie in the rough state. The action of the sun and rain is very helpful in breaking up the lumps.

Very light soils are best manured with cow dung where it is available, and should, if possible, have a good application of strong loam or clay soil.

Drainage

Unless the ground is sandy or stony and naturally well drained some provision will need to be made to carry off excess moisture. In soils that are not too tight this can best be done by underground drains which not only remove surface water but also that which stands in the soil and "waterlogs" it. It is this stagnant water that is harmful to the plants. Details of the undergound system cannot be given here; but briefly, it consists of lines of tiles laid at a depth of about two to three feet, having a uniform slope to an outlet at a lower level than the field drained. In heavy, sticky clay soils underground drains are not very satisfactory, and in such cases one should depend upon raising the garden beds to allow the surface water to run off along the paths.

Trenching and Digging

Trenching of the ground to be used for gardens is very desirable and in this country of cheap labor the chief obstacle to the practice is not present. Trenching consists of taking off a strip of top soil about three feet wide and one foot deep. This should be removed to a pile at one side of the garden. Then dig the ditch thus made another foot deep, turning over and breaking up the soil and replacing in the bottom of the ditch. Then mark off another three foot strip and take off the surface soil as in the first case, using it to fill the first ditch. Continue this till the end of bed is reached, when the surface soil from the first strip is filled in on top

of the dug up soil in the bottom of the last ditch. By this means the whole of the bed is dug up to a depth of about two feet and still the fertile soil is kept on top. Beds thoroughly trenched will not need to be done over for many years. In light soils trenching is not so important as in heavy soils. Thorough drainage is especially important in trenched soil.

In ordinary digging the important thing is to turn the soil over thoroughly and, except in very shallow soils, dig to a depth of nine to twelve inches. Bury all weeds, straw or other litter as the ground is dug. The importance of having the surface soil loose and open to the air cannot be over estimated.

If very sloping land is used for gardens the beds should follow the contour of the hill so that the danger of heavy rains washing the soil away is largely prevented.

Watering and Irrigating

While it is difficult to lay down any hard and fast rules for supplying water to the growing crops yet there are a few general principles which it is well to understand. First of all, it does more harm than good to sprinkle the surface frequently after crops are well started. When watering it is most important that the ground should be thoroughly soaked. If this is done every one or two weeks, especially if the land is trenched, it is far preferable to a lighter and more frequent application. The roots of all the plants will then be encouraged to go deeper into the soil and will be out of the way of the hot sun and drying winds. The ground should not be made sodden or boggy, however, especially if not well drained.

It is much the best plan to use a hose sprinkler where one is available. If kept going for hours at a time it is about as good as rain. Another method is to run the water into prepared drills or shallow trenches,

letting it soak in gradually. Another good way is to sink a few flower pots, into the ground to the top and when watering fill these. If these are regularly filled the subsoil is kept moist and the plants are encouraged to root deeply, while the loss from evaporation is largely avoided. When land is regularly watered mulching or frequent working of the surface should be practised, otherwise the surface of the bed will become hard and baked, evaporation be encouraged and the plants injured instead of benefited.

In watering young seedlings care should be taken not to break them over or wash them into the ground by too strong a current of water. The ordinary Chinese water bucket with bamboo nozzle is the best device for applying water, being superior to the foreign style of sprinkler tops on watering cans. A device similar to the bamboo nozzle can easily be made for the lighter tin watering cans by any tinsmith. Not only does this apply water in a thin, even, sheet but it can also be used to advantage for applying liquid manures that contain some undissolved material since it does not become stopped up as do the sprinkler tops.

Another word should be said on the subject of watering. In all cases where seeds are being germinated the soil must be kept moist, though not wet. Alternate wetting and drying causes more dissatisfaction with the results obtained from the use of seeds than any other combination of factors. Above all else, keep the germinating seedling growing steadily from the time development first starts.

Mulching

In hot dry climates it is advisable to practise mulching. In the spring, before hot weather sets in, cover all beds two inches deep with well rotted manure, grass cuttings or any other substance sufficiently open to let the water through and yet keep the soil moist and cool. Land so

treated will not require half the labor in watering and the plants will thrive much better. Where this is not done the surface should always be kept well hoed and loose; this acts in a similar manner but is not so good as the mulching with organic matter. When the season is over the litter should be dug in, and it will act as an excellent fertilizer. Then, after the seeds are planted, there should be a light cover of rice straw or some similar material applied to keep the surface of the bed from becoming dry and hard. When the seedlings are up, move the straw covering carefully to each side of the rows so that the seedlings need not become long and spindling in reaching up to the light. The straw between the rows will help control weeds and will conserve moisture.

Manuring

The best results cannot be secured with either vegetables or flowers unless plenty of manure be used. There is nothing to equal well rotted stable manure but where it is not obtainable other materials should be used. Chemical fertilizers are good if properly used. They should be mixed with composted material in most cases.

The proper rotting of stable or cow manure is hastened by piling it up in heat piles with as perpendicular edges as possible. It soon generates great heat and when it is cooling it should be turned over, after which it will soon be ready to use. This process will kill any weed seeds present, which otherwise are a great nuisance in stable manure.

Air slaked lime is a most excellent and valuable agent for increasing the productivity of a soil though it does not actually enter to any considerable extent into the tissue of the plants. It is very beneficial to the nitrifying bacteria present in the surface soil, enabling the plants to absorb the nitrogen present in the soil. These same bacteria cannot live in a waterlogged soil or one with little air in it; hence the importance of proper

drainage and regular tillage of the surface soil. Under no circumstance should lime be applied at the same time as stable manures or any other material containing nitrogen. Lime is also excellent as a deterrent to most insects and fungus pests.

Compost Heap

Every garden should have a compost heap, where garden refuse can be put to rot. Leaves, hedge clippings, waste vegetables, weeds, straw, grass clippings, etc. can be collected into a heap, which must be turned occasionally so that the whole may become thoroughly rotted. It should be kept wet by applications of urine if possible, and poultry, pig or goat manure may be added with benefit. Gypsum is an excellent absorbent and if obtainable can be scattered over the pile occasionally to advantage. Flies can be largely controlled by covering the pile with a layer of soil from time to time. It takes about one year more or less according to its composition, to make compost. When ready it should be spread over the land, used in renovating flower gardens, or mixed with sand and loam in equal proportions for growing seedlings, pot plants, etc. Once tried, no one who values the pleasure of having a vigorous growing crop will care to be without a compost heap, especially in South China where stable manures are difficult to secure.

Liquid Manure

By the term "liquid manure" as used in this bulletin reference is not made to human urine, but is meant only to cover urine of farm animals, bean or peanut cake digested in water, or commercial fertilizers dissolved before using, or liquid solutions of solid manure of farm animals. If human urine is to be used at all in the vegetable garden it should be used only for tall crops such as corn or pole beans or for vegetables that are thoroughly cooked before using.

Green Manures

Where it seems desirable to practise green manuring no plant is so good as some of the legumes such as peas, beans, or some of the native legumes such as Hung Fa Tsz (紅花子), or Luk Tau, (綠豆). These should all be turned under when still young and before hard woody stems have been developed. Any other rank and quick growing crop can be grown but it will not add nitrogen to the soil as will the legumes, their chief value being in the organic matter they add to the soil and the improved physical condition resulting therefrom.

Weeding

An old adage says: "One year's seeding makes seven years weeding." The main object is to prevent any weeds from seeding. If the opportunity is taken to hoe between the rows in hot dry weather and the compost or manures are well rotted there should be little trouble from weeds in a small garden; but they require constant attention, and often, through a few days neglect at the beginning of the season the weeds get beyond control and cause endless trouble. A day's work while the weather is favorable and the weeds young, may be worth a week later. The only way to get rid of the troublesome grasses in the garden is to carefully dig up and remove all roots and underground stems, as many of the most troublesome ones spread from parts left in the ground. Other weeds can generally be killed by cutting them off below the surface of the ground with a hoe. The hoe should be kept going constantly through the growing season, both to control the weeds and to keep the soil loose, unless a mulch is used.

Frames and Shelters

In a climate like that of South China there is little occasion for glassed frames to protect seedlings. In the coldest season it is well to have a frame

made of boards or masonry about two feet high at the rear sloping to about one foot in the front and about four feet wide by as long as desired. This may then be covered during the night and, if quite cold, during the day, by covers of light cloth tacked to wooden frames. The same bed can be used for starting tender seedlings in hot weather by substituting a slatted cover made from split bamboo. The degree of shading provided can be varied by the closeness of the strips of bamboo.

Necessary Tools

The essential tools for gardening are very few. If workmen are employed for most of the heavy work and routine care, it will be found that about all that is required is an ordinary Chinese hoe, a rake, and a pair of water buckets. A light hoe such as is used in America is worth having because of its lightness. In addition a garden line, a trowel for transplanting, and if a hedge or shrubs are kept, proper pruning tools should also be provided. A good supply of bamboo stakes for marking the beds should be provided, so that the name of varieties and date of planting can be recorded. All tools should be kept sharp and free from rust; after use they should be cleaned before putting away.

Paper Pots

It is sometimes desirable to start seeds in small pots so that the seedlings can later be transplanted without injury to the roots. Such pots can be cheaply and easily made as follows. For pots four inches deep and two inches in diameter cut up old magazines or newspapers into strips six inches wide and about ten inches long. Prepare a cylinder of wood two inches in diameter and four inches long. A nail driven part way into one end makes a convenient handle. Wrap the paper around the block, letting it project two inches beyond the end that does not have the nail in it. Fold this projecting end over and fasten with sealing wax, or fill with earth and place in a box which is set a couple of inches deep in the garden bed. When the seedlings are set out the paper should be torn away to give the roots a chance to spread.

GARDEN PESTS

Aphis

Aphides are soft bodied insects of various colors, commonly called "plant lice". They are particularly prevalent on new shoots of roses and chrysanthemums and a continual watch should be kept so as to attack them as soon as they appear.

For plants with delicate foliage tobacco water or tobacco and soft soap solution should be used. Kerosine emulsion may also be used for spraying the stems of trees. The aphides can be kept in check on vegetables by frequent sprayings with tobacco water, thus making rapid growth possible for the plants. Burn all badly infected plants.

Crickets, Beetles, Grasshoppers

These can very often be destroyed by a poison bait, made as follows. Take one ounce of Arsenate of Lead or Paris Green, one pound of bran, enough molasses or treacle to make a stiff paste; roll into lumps the size of a walnut and place here and there among the plants. Remember this is a poison and should be kept away from children, domestic animals or birds.

Cabbage-fly and Caterpillar

These are extremely troublesome pests, and are very difficult to combat. Tobacco dust and lime dusted on very young plants when they are wet help in their control. When planted out sprinkle the whole plant and bed with air slaked lime.

Cut Worms

These destructive caterpillars hide beneath the surface of the ground during the day, coming out at night and eating the young plants at the

surface of the ground. If the ground is watered with a very weak solution of mustard and water they will come to the surface and may be killed. Apply when the ground is already wet. Poisoned bait mentioned above is also effective if applied just before nightfall.

Mildew, Rust and other fungus diseases

If on deciduous trees, spray with lime sulphur solution (one gallon in ten of water) during the dormant season; when in leaf, use one gallon in forty gallons of water. Bordeaux mixture can also be used. For mildews, dusting with sulphur when the plants are wet is sometimes effective.

Scale

Many of the forms of scale insects can be effectively treated with Lime-Sulphur, Kerosine Emulsion, or any of the regular contact insecticides if properly applied.

Snails and Slugs

These are very destructive and if small seedlings are to be grown successfully they must be kept in check. Put bait of dry bran at various places in the garden, especially after a rain, and hunt for these pests after dark with a lantern. Put them in a can of lime or strong brine solution. Frequent hunting of them will keep the garden comparatively free from them. A ring of dry lime around the seedlings will keep them off.

Sweet Pea Mite and Pea Spot

The first is a microscopic animal the other is a fungus, both showing their presence by yellowing the lower leaves of the various peas or other soft foliage plants. Treatment for both is to spray once in two weeks, especially under the leaves, with Lime-Sulphur solution, using one part in fifty of water.

Tomato Wilt

A common tomato disease here which is caused by microscopic worms that enter the water passages of the plant and shut off the water supply to the leaves, causing wilting or dwarfing of the plant and misshaped foliage. The only control measure seems to be to rotate and keep the plants growing vigorously.

Bean Wilt

(See cultural directions for beans)

REMEDIES

Bordeaux Mixture

This is one of the safest and most effective sprays for fungus diseases-scab, rust, mildew, etc. The usual formula is four pounds of fresh burned lime, four pounds of copper sulphate (bluestone) and fifty gallons of water. Stock solutions should be prepared of the lime and bluestone, but they should not be mixed until the spraying is to be done. To make the stock solution of bluestone use two pounds of crystals to a gallon of water, suspending them in a cloth bag in the water. Make and keep the solution in a glass or earthenware container. Slake the lime to a creamy consistency. Cover the containers to prevent evaporation.

To make the spray mixture add two gallons of the bluestone solution to twenty five gallons of water and then introduce the lime diluted with the other twenty five gallons of water. If insufficient lime is used the foliage is sure to be burned; it is better to have an excess.

Kerosine Emulsion

Kerosine emulsion is the best insecticide for sucking insects. It is prepared as follows: dissolve one half pound of soda in one gallon of boiling water, remove from the fire and add two gallons of kerosine, thoroughly agitating the mixture as the latter is added. A spray pump turned back into the container is the best device for mixing it. Continue to agitate it until the oil is entirely emulsified, when the mixture will be of the color and consistency of thick cream and the oil will not separate out on standing. Dilute with ten to twenty parts of water, depending upon the nature of the foliage to be sprayed.

Paris Green

Paris green is a good insecticide against chewing insects, being a

stomach poison. It is best to use lime with it to protect the foliage from burning. One pound of lime and one of paris green are used with seventy five to two hundred gallons of water, the strength of the solution depending upon the susceptibility of the foliage to burning. Keep thoroughly mixed while applying.

By adding paris green to Bordeaux mixture the two can be applied at one operation.

Tobacco Water

This is one of the cheapest and most satisfactory insecticides, especially for tender foliage as it will not harm it at all. It is prepared by soaking in water, or if desired quickly, by boiling it. The stems can be used till they fail to color the water any more, when a new supply should be used. The proper strength is when the liquor is about the color of moderately strong tea. Adding soft soap to it before applying is an improvement.

Lime-Sulphur

If commercial Lime-Sulphur preparations can be had they are the most convenient and safest to use, but the preparation can be made as follows. Slake six pounds of freshly burned lime to a creamy consistency and mix with it twelve pounds of flowers of sulphur. Then add this to fifteen gallons of boiling water and boil vigorously for one or two hours until the sulphur is all dissolved and the solution becomes a deep red or amber color. Allow the sediment to settle out, strain off the liquor and dilute with thirty five gallons of water. This should be further diluted depending upon the kind of plants to be sprayed.

VEGETABLE GARDEN

General Arrangement

Since our growing season is chiefly during the winter months, the ideal location for a garden is one sloping gently to the south and east and protected on the other sides from strong winds by buildings, trees, or high fences. These should not be so close as to overhang or shade the garden during the middle of the day, though shade in the morning or late afternoon is not objectionable. Where other shelter is unobtainable vines growing on stoutly built trellises will serve the purpose fairly well.

It is very bad policy to have fruit trees in the garden and it is urged that no trees be planted in or near land intended for cultivation. The heavy cropping and continuous cultivation does not help the trees. On the other hand, the shade and want of moisture caused by them are, as a rule, fatal to the growth of vegetables.

It is wise to divide the garden into sections, say twenty-five to forty feet across, and then to subdivide by temporary paths into beds about six feet wide. The paths should be constructed so as to act as drains for surplus surface water during heavy rains. Where possible it is desirable to run the beds north and south, as vegetables planted in this direction will not shade each other as much as those planted east and west.

Raising Seedlings

The most important thing is to get as good seed as is possible. Avoid cheap seeds as they are generally of doubtful value. They may or may not be good. Considering how little the best seeds cost when compared with the

value of the crop and the cost of labor and trouble it is not worth while to run any unnecessary risk.

Small seeds, excepting root crops, are generally best raised in nursery beds and for this purpose a small portion of the garden should be reserved. A light sandy soil is the best. If the garden soil is not light and sandy it is better to raise the seeds in small boxes about three inches deep, with holes in the bottom to insure thorough drainage. The soil used in these "seed flats" should be composed of equal parts of sharp sand, well rotted manure or compost, and garden soil. During very hot, sunny weather it is advisable to shade the nursery beds or seed flats. Such shades are easily constructed of bamboo and rice straw or of sheets of interwoven split bamboo.

The depth to sow is influenced by the kind of seed and the character of the soil. In light, dry soil fairly deep sowing is advisable. In moist, heavy soil shallower sowing is better. Such seeds as peas, beans, sweet corn may be sown one to three inches deep; beets, cucumbers, melons, pumpkins and similar seeds one-half to one inch. Smaller seeds require only a light covering of fine soil.

After sowing, it is advisable, if the weather be dry, to give a thorough soaking with water, which in most cases will be sufficient moisture to germinate the seeds. In watering seedlings be very careful not to wash out the plants. Some soils always cake on the surface when constantly watered. It is difficult to grow fine seeds under these conditions, and in such cases a light mulching of well rotted manure or leaf mold scattered over the surface after sowing is recommended. In raising seedlings for transplanting it is always desirable to give the bed a good coating of well-rotted horse or cow manure as this encourages the production of a large fibrous root system. If carefully transplanted afterward in suitable weather the plants will not suffer by removal.

It should be remembered that all seeds do not take the same time to germinate nor do they grow with equal strength or vigor. Onions, leeks, parsnips and parsley are naturally weak growers and though of good quality may fail under conditions that would be quite suitable for beans, peas, cabbage or turnips. Such vegetables as lima and butter beans, cucumbers, melons, pumpkins and tomatoes, depend upon a warm soil temperature.

Most crops do best if sown in rows far enough apart for cultivation between the rows. It is best not to sow broadcast except in nursery beds or seed flats and then only if the seedlings are to be transplanted.

Transplanting

It is best to transplant in moist cloudy weather, and advantage should be taken of any such days during the fall to get as much of it done as possible. Much better results are thus secured than under any other conditions. Soak the seed bed thoroughly and then lift the seedlings out carefully so as to disturb the roots as little as possible. When possible always take a little of the soil which is attached to the roots. Plant out in rows correctly spaced for the various kinds of plants, setting at the same depth as they were in the seed-bed. A dibble or stick to make the hole is a convenience. After inserting the seedling this can be used to press the ground firmly around the roots. The plants should then be thoroughly watered and, if the weather be very hot, shaded in some way. Chinese workmen are very adept in their use of rice straw or dry grass for this purpose. Sometimes they make rough rings of straw about six inches in diameter and put one around each young plant; other times they tie some to a piece of bamboo and make a tentlike shade, while for other plants they will make a sort of mat elevated a few inches from the ground. Anything that will break the force of the sun's rays will serve.

Rotation of crops

To get the best results in the vegetable garden it is necessary to plant different kinds of crops at a given place in successive years. Cabbage should not follow cauliflower, or carrots succeed parsnips. Each crop should be as dissimilar as possible from its predecessor. A spindle rooted crop should succeed a fibrous rooted crop, etc. In this way more thorough use is made of the fertilizer added to the garden and diseases and insects are to a large measure controlled.

Fallowing

All land used for vegetable gardens should be "fallowed" or kept vacant for a few months periodically as the heavy cropping exhausts the soluble salts in the soil. By a period of rest and exposure to the weather decomposition of the soil particles is accelerated, and the fertilizer constituents are made available for the following crop. Exposure to the sun also has a beneficial effect in sweetening the soil. The best time to fallow in hot, dry climates, is during the summer. To get the best results from fallowing, the soil should be dug and left to lie in the rough condition. In a well-kept garden the ground should never be really idle. As soon as one crop is off another should be planted or the ground dug up and fallowed.

CALENDAR
OF
VEGETABLE PLANTING TIMES.

A indicates the best time to plant.
B „ the chances of success are fair.
C „ unusual season or care will possibly give success.

VEGETABLE	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept	Oct.	Nov.	Dec.
Asparagus	...	...	...	...	...	...	...	...	B	A	A	...
Beets	B	B	C	C	C	...	...	C	B	A	A	A
Beans, String	A	B	B	C	C	...	...	C	C	B	A	A
„ , Lima	B	B	C	...	...	...	C	B	A	A	A	A
„ , Chinese Long	B	A	A	A	B	B	B	...	...	...		...
„ , „ Short	...	...	...	...	A	A	A	...	...	...		...
Cabbage	...	...	...	...	...	C	C	B	A	A	A	B
Cape Gooseberry	...	...	...	...	...	...	...	A	A	A	B	...
Carrots	A	B	C	C	C	...	...	C	C	A	A	A
Cauliflower	...	...	...	...	...	...	...	C	B	A	A	B
Celery	B	C	...	...	...	C	C	B	A	A	A	B
Chard, Swiss	A	A	B	B	...	...	...	B	B	A	A	A
Corn, Sweet	C	C	B	B	B	B	B	A	A	A	A	A
Cress	A	C	C	C	B	B	B	B	A	A	A	A
Cucumber, Foreign	B	B	...	...	...	...	...	...	...	...		B
„ , Chinese	B	A	A	A	B	B	C	...	...	...	C	C
Egg Plant	B	A	A	B	B	...	...	...	...	...		C
Endive	A	B	...	...	...	...	...	...	B	A	A	A
Kohl Rabi	...	...	...	...	...	...	...	C	B	A	A	A
Leek	...	...	...	...	...	...	...	...	B	A	A	...
Lettuce	A	B	B	C	C	C	C	B	B	A	A	A
Melon	...	...	...	...	...	...	...	...	...	...		...
Mustard	B	B	B	B	B	C	C	B	B	A	A	A
Onion	B	B	B	...	...	...	C	B	A	A	A	A
Paak Tsoi (White Veg.)	...	...	...	...	...	...	...	...	...	...	...	
Parsley	...	...	...	...	...	...	...	...	A	A	A	
Peas	B	C	...	...	...	...	...	C	B	A	A	A
Peppers	A	A	B	...	...	...	...	...	...	...	...	B
Pumpkin	...	...	...	...	...	...	...	...	A	A	B	...
Radish	B	B	B	C	C	...	...	C	B	A	A	A
Rhubarb	...	...	...	...	...	...	...	...	...	A	B	...
Spinach, Foreign	C	C	...	...	...	...	...	...	B	A	A	...
„ , Chinese	B	A	A	A	A	B	C	C	...			C
Tomatoes	B	B	C	...	...	C	C	B	A	A	A	A
Turnips	A	B	C	C	...	...	...	...	C	B	A	A

CULTURAL DIRECTIONS

Asparagus

This plant is a perennial and when a bed is properly prepared and planted it will last for very many years with little attention, providing the asparagus is cut in reasonable moderation. The beds should be long and narrow and not more than six feet across so that the asparagus can be gathered without stepping on the bed. Any good garden soil will grow asparagus but it must be well enriched with manure; a well drained situation should be chosen, and the whole of the soil removed to a depth of two feet. If bones are available the bottom of the trench should be covered with them and the ditch filled with good soil, to a depth of four inches. Then complete the filling by using alternate layers of stable or cow manure until the surface is reached. Coarse sand mixed with the soil is advantageous.

When the bed is complete mark out the rows one and one-half feet apart. A bed six feet wide will make four rows. In September or October the plants should be set out, using one or two year old plants. If the weather is dry, water the bed thoroughly and then cover with three inches of well rotted manure. During the first year only weak shoots will be given and these should not be cut. After that they may be cut for several months each year but should be allowed to grow tops during the summer to rejuvenate the root stocks.

If plants are not available, seeds may be used, putting three seeds where each plant is to be. Later the weak seedlings should be cut out. If well grown and forced on with regular applications of liquid manure the plants will give a few cuttings in the third season after sowing. Do not transplant in the coldest or hottest season.

Palmetto and Barr's Mammoth varieties are recommended.

Bean

There is considerable doubt in the minds of many people as to the meaning of the various names used in connection with beans in seed catalogues and elsewhere, common usage in various countries differing. In general, garden beans are classified as bush (or dwarf) and pole (or tall or climbing) types. These groups are again divided into kidney and lima, the term kidney including all the common garden beans whether of one type or another. This group may again be subdivided into wax and green pods. The same subdivision may be made under pole beans. Snap or string beans refer to kidney beans that can be eaten with the pod. A good string bean is stringless, however, in spite of the name. Green shell beans differ from snaps in that the pod cannot be eaten; instead the green seeds are removed from the pod before cooking. Runner beans are a distinct class of the garden pole beans.

All beans do best in an open sunny situation and should be planted in rows running north and south, especially if a pole or climbing variety. Most beans will not stand the slightest frost and the planting time should be such as to avoid it. At the Canton Christian College we have been unable to grow beans successfully if planted before November 1st, with the exception of lima beans. This is due to a small fly which deposits its eggs in the growing plant near the surface of the earth. When these hatch they feed upon the young plant and it wilts, apparently rotted at the ground. Examination will reveal the larvae in the "rotted" tissue. If a crop is attacked by this insect burn all the affected plants and do not use that part of the garden for beans for at least a year. No other control measure has been worked out. Lima beans if planted in August generally escape this fly.

Lima beans may be planted any time from the latter part of July to November. Strongly built trellises are essential for the tall type because

of their long period of growth and bearing. They begin to bear in three to four months and continue to bear for nearly a year. Plant in rows two and one half feet apart, eight to ten inches apart in the row, and one to two inches deep. Lima beans are substitutes for, and much superior to Broad or Haricot beans. The King of the Garden or Early Leviathan are the best tall types. Bush limas are not so desirable as the tall ones for our conditions. The best bush variety is Burpee's.

Tall or Pole Kidneys are planted at the same distances and depth as pole limas. Instead of planting in rows some people prefer to plant in hills (3 to 4 seeds per hill) placed 3 to 4 feet apart each way. Poles from each hill are tied together in groups of four near the top, making a wigwam trellis.

Bush beans of all sorts should be planted in rows 18 to 24 inches apart, spaced 2 to 4 inches apart in the rows, and one to two inches deep.

Kentucky Wonder and Burger's Green Pod Stringless are choice varieties of pole kidneys for South China. Extra Early Valentine, Morse Tender Pod and Main Crop Refugee are desirable bush beans.

Beet

Deep, rich, well drained land which has been heavily manured for a previous crop is best suited for beets, though they succeed in almost any soil. Sow one inch deep in rows nine inches apart; later thin to four inches between plants. Those removed in thinning are easily transplanted to other parts of the garden, as the border of other beds, but they are likely to have more hairy roots than those not transplanted. In transplanting cut the leaves back to prevent wilting. The leaf trimmings, or the whole plant, make delicious "greens".

Beets are quite resistant to disease and insect injury and if grown in the cool season and furnished with enough water are sure to be a success

Plant the seeds any time from the first of October to March, planting every month for a continuous supply.

The Standard varieties of proven merit in our climate are Crosby's Egyptian, Detroit Dark Red and Morse's Improved Blood Turnip.

Swiss Chard (Silver or Spinach Beet)

This relatively little known vegetable in America is grown for its leaves which make an excellent substitute for spinach. It grows to perfection in the hot dry season when spinach cannot be grown, and deserves more attention than it has received in the past. The cultural methods are the same as for beets.

In using this vegetable do not pull up or cut off the whole plant, but remove the larger leaves by a twisting motion of the hand. The small central leaves will develop and several gatherings can be had during the season, a few plants supplying all a small family needs.

Borecole, Scotch Kale or Curly Greens

These favorites of colder climates cannot be grown very successfully in South China because they require hard frosts to make them tender and of good flavor.

Brocolli

This vegetable is a hardy variety of cauliflower, and more resistant to frost. In South China cauliflower should be grown instead of it.

Brussels Sprouts

Brussels Sprouts are similar to Borecole in climatic requirements and are not grown very successfully in our climate, forming few and inferior heads. They also require hard frost to make them tender.

Cabbage

Cabbages do best in a deeply trenched, highly manured soil. The richer the land the more early and abundant the crop and the better the flavor and quality. They are usually started in seed beds or flats and transplanted when four to six inches tall to rows two to three feet apart and one and one-half to two feet apart in the row. Sow seeds any time from August to December. Do not plant too thick as long spindly plants rarely ever head out well. When the heads are fully formed loosen the roots a little to check growth and prevent splitting of the heads.

Capsicum or Pepper

This plant thrives well in South China in any good garden soil. The seeds should be started in well manured seed beds or flats, and when the seedlings are four to six inches tall they can be transplanted to their permanent location in rows two feet apart, spacing the plants eighteen inches apart in the rows.

Carrot

For the long rooted carrots a deep, sandy, soil is essential to the growing of well shaped roots and ease in lifting them when mature. For heavier soil the half-long varieties are best. This class, fortunately, includes the best table carrots.

Land heavily manured the preceding season for green crop, or fallow land which has been deeply dug, is most suitable for growing this crop. Fresh manure always tends to the production of fibrous and branched roots.

Always sow the carrot seed one-half to one inch deep in rows about six inches apart. As carrots have fine seed-leaves that are hard to see when they first come up, it is well to sow radish seeds thinly in the same rows, and at the same time, with the carrots. The rows can then be easily seen

and weeding can start immediately. The radishes will be ready for use in a short time and pulling them will help to thin the carrots. Thinning should continue until finally the carrots stand at least two inches apart in the row. If this is done at intervals a supply of tender young roots can be had over a longer period.

Carrots can be sown at any time when there is not continuous heavy rain or frost. In especially hot dry weather shade of some sort is required from the noon-day sun. It should be so contrived as to be easily removed in the evening. An abundance of water is necessary to the rapid growth of this vegetable and the production of well flavored and tender roots.

Danvers half-long and oxheart varieties have done very well for us and are of about equal merit.

Cape Gooseberry

A species of this plant is found growing wild in some parts of America and China. In America it is commonly called "Ground Cherry". As a cultivated plant it is one of the most prolific and useful berries. It is easily grown in South China and as the name indicates is a good substitute for gooseberries. To secure fine large berries they should be sown in August or September in a good seed bed, and transplanted directly to their permanent location. When ready to set out in the field plant them three to four feet apart and after that keep thoroughly free from weeds. Once fairly established they will last two or three years but the greatest quantities of good berries will be secured the first year; hence it should be grown as an annual.

The fruit, when nearly ripe, makes fine pies, jams, jellies and preserves.

Cauliflower

Cauliflower requires much more care, richer soil and better conditions than cabbage. It is a weaker grower from the seed onward, and, if severely checked in growth by drought, insect pests, or poverty of soil, is almost certain to "button", i.e. instead of forming good heads, to split up into innumerable sprouts or to produce no head at all. When this happens the grower is apt to blame the seed. To grow good cauliflower it is necessary to use deep rich, well drained land which has been growing some other crop than a member of the cabbage tribe. If possible, fertilize heavily with well rotted compost or stable manure. Tie the leaves over the heads to prevent their becoming somewhat green.

Sow the seeds thinly in nursery beds or flats, from August to December using richly manured soil. Transplant when four to six inches high to their permanent location about two feet apart each way. The weather should be cloudy or rainy when the transplanting is done. If it is not, it is well to "puddle" each plant, i. e. dip the roots in a mixture of clay and water, well mixed to the consistency of cream, as quickly as they are lifted from the seed bed. This prevents the drying of the small rootlets. After transplanting, water thoroughly and be sure the plants are never in need of water thereafter. Weak liquid manure can be given once every two weeks to advantage, applying it when the soil is already moist.

Celery

Sow from August to December in a good rich nursery bed, carefully protected from excessive sun and heavy rain but supplied with plenty of water. A shade three feet from the bed is good. When the seed bed is well prepared water it thoroughly and leave for twenty four hours to allow the surface to become dry. Then make transverse furrows one inch deep and four inches apart. Sow the seeds in these furrows, cover with fine

soil and water carefully. To prevent sowing too thickly mix the seed with sand and sow the two together. Water daily with a fine spray until the seedlings are well established. Thin gradually until the plants stand four inches apart, replanting those removed in another bed.

When the seedlings are six inches tall transplant to a carefully prepared, well manured place in the garden, planting six inches apart in rows six to ten inches apart. Close planting helps to blanch the stems. In transplanting disturb the roots as little as possible, and water thoroughly to settle the earth around the roots. Repeat irrigation often enough to keep the soil very moist. Celery requires an abundance of water. Alternate use of liquid manure (see page 8) and water forces the growth and produces the best plants.

Blanching in hot countries is best done by gathering the stems of each plant together and surrounding with a tile, the top of which is also covered. Do not blanch the whole crop at once, but just a few at a time as needed. About a week to ten days will be necessary for the process.

The Giant Pascal is a luxurious growing variety but is hard to blanch. It is delicious as creamed celery. Golden Self-Blanching and White Plume varieties are best for blanching.

Corn, Sweet

This is one of the most desirable vegetables and easiest to grow and can be planted at almost any time in South China, heavy and continuous rains alone being detrimental as they wash away the pollen and prevent the filling of the ears.

Plant one to two inches deep in rows from two and a half to three feet apart, and eight inches between plants. Plant at intervals of two weeks for a succession. Always have sufficient plants together to insure proper pollination.

Heavy irrigation every week or ten days is much better than daily sprinkling for this crop, after it is well started.

Corn can make better use of coarse manures, street sweepings, etc., than any other vegetable crop and will repay a liberal use of them or other fertilizer materials. For such tall crops as corn, night soil may be used with reasonable safety if desired.

The cobs should be pulled when the kernels are well filled out but still soft and milky.

Cress and Mustard

These salad plants are not fully appreciated by many Americans but their demand in European markets is so great as to thoroughly commend them to everyone, especially where salad plants are difficult to secure. Any fine soil, or pure sand, will produce a crop. If sown on the surface, and kept moist, the crop rises clean and almost fit for the table. The seed leaves are used when two inches high the cress being available about ten days after planting the seed. Mustard is a more rapid grower and should be planted several days later than cress if it is to be used with it. Resow every week or ten days for a succession. If badly eaten by insects when grown outside sow in boxes or pots indoors.

Cucumber

Our experience has shown that foreign cucumbers do not do well if planted at the same time as the Chinese cucumbers. We are inclined to believe they can be successfully grown in the fall and winter but this has not been entirely demonstrated. The native cucumbers are easily grown and are able to endure the hot rainy season of the spring when some of the other desirable vegetables cannot be grown.

Egg Plant

As with cucumbers, egg plants of good quality can be secured so cheaply from the Chinese farmer that their importance in the home garden is doubtful. Unlike the cucumber, however, egg plants are not especially difficult to grow.

The crop succeeds on any deep, well-tilled garden soil. Seed is sown in lines six inches apart on a bed of friable loam. When the seedlings are six inches high they are transplanted to fruiting quarters in rows two feet apart at intervals of eighteen inches in the rows. When the plants are nearly mature support of some kind will be necessary to keep the fruit off the ground. Keep well watered. When blossoming begins use liquid manure every few days.

Endive

Endive is a delicate salad plant, similar to lettuce, and deserving of more attention than it has received in the past. It is easily grown, the cultural directions being the same as for lettuce. Its use is also similar. When nearly full grown the plants should be tied up, or covered by some light excluding thing like a box or tile, to bleach them. They require rich soil and plenty of water. Sow in the fall and winter months.

Kohl Rabi (Turnip-Rooted Cabbage)

It is especially suited to places too hot for the turnip to thrive, and in those places its mild turnip-flavored head of thickened leaf bases is very welcome. Sow in a seed bed or flat as in the case of cabbage, transplanting when about five inches tall to rows eighteen inches to two feet apart at intervals of ten inches between plants in the row.

It should be quickly grown to secure the mild flavor and fiberless condition so desirable in this vegetable. It should be used when about half grown, while still young and tender.

Lettuce

In a moderate temperature lettuce will flourish in any rich garden soil, if kept moist and protected from very heavy and long continued rain. A plot should be chosen for this vegetable that was heavily fertilized the preceding year, and does not need fresh manure.

Seed may be sown on an ordinary bed, unless heavy rain is anticipated. In such cases the sowing should be in boxes under shelter of a roof, and where light has free access. The seedings must not be crowded; when two inches high they can be planted out nine inches apart, and should be watered daily in dry weather to ensure rapid growth. As soon as the plants are mature they must be used or destroyed. A continued supply of tender delicately flavored lettuce can only be maintained from regular sowings every ten days to two weeks.

Lettuce can be grown at any time during the regular growing season but special preparations will be needed to grow it during the hot, rainy summer in the vicinity of Canton. It is necessary to protect the plants from the heavy rain and hot sun, at the same time permitting enough water and light to reach the plants to meet their needs.

These conditions are best secured by raising the beds about eight inches to provide drainage of excess water. The bed should be covered at a height of about three feet with matting that will break the driving rain into a fine mist before it hits the plants. This matting will also shut out the hot midday sun. The beds should not be over four feet wide. Extra matting or other protection should be at hand to put on the windward side of the bed during driving rains.

Weekly watering with liquid manure will force the growth and produce large crisp, tender heads.

Melon

We have never been able to grow melons on anything like a successful scale at the Canton Christian College, chiefly because of the attack of insects. We believe, however, that the foreign melons can be grown here if the proper varieties can be determined upon for our conditions. Work along this line is being done each year but for the present we are not prepared to make recommendations for their growing here beyond the general requirements of melons in other places. In a few places foreign watermelons have proven entirely successful.

Melons require a long hot season where the day and night tempseatures are nearly the same and where frost does not occur during the growing season. Sandy soils, supplied with an abundance of organic matter are best for them. Stable manures are the best available for this crop if well rotted before using. For the home garden where only a few vines are desired the following system works well: Dig a hole about three feet in diameter and eighteen inches deep. Fill this with some good soil mixed with organic matter. In the center and at three or four places near the edge of the bed thus prepared, sink large tin fruit cans with holes in the bottom and sides, or tiles, and fill with fresh cow or horse manure to within a couple inches of the top. Every day while the plants are small apply water liberally, pouring the water into the cans. The seeds are planted in the prepared soil around the cans.

Onion

Onions do best on a rich, adhesive soil that has been heavily manured for the preceding crop. Sow the seeds in rows ten inches apart, from September to January. After the seed is sown sprinkle wood ashes or soot over the surface. These not only help the crop but discourage insects. As soon as the seedings come up begin the thinning process and pull all

weeds before they become too large. They should be weeded several times during the growing season, clean cultivation being essential for this crop. When nearly mature bend the tops over. This will help in their proper ripening.

Parsley

This useful plant should be sown in the fall months in finely worked soil that is free from weeds. Sow thickly in permanent rows, and afterward thin to a few inches apart. As this seed takes a long time to germinate, the ground should not be hastily disturbed if the plants do not at once make their appearance. Parsley makes a very good edging for beds.

Peas

For a continous supply of this favorite vegetable sow every two or three weeks during the fall and winter months beginning about the last of October. Plant them about an inch deep in rows a foot apart for the dwarf variety and about three or four feet for the tall variety. Plenty of light and air is essential to a maximum yield. The tall kind should have poles when they are about six inches high.

Alaska is a very good dwarf variety; Yates Hundredfold; Telephone and Senator are good tall varieties.

Rhubarb

This delicious "pie plant" can be grown rather easily from seed. Sow the seed about the middle of October in a seed bed and when in rough leaf, prick out in nursery rows six or eight inches apart. The following fall select the most promising seedlings and plant three or four feet apart in the permanent bed, which must be well manured; in fact the land cannot be too rich for this crop. The more stable and liquid manure given the better the crop. The largest of the leaf stems should be pulled, always allowing

enough to remain to keep the plant healthy. In warm climates rhubarb tends to lose its vigor and a few seedlings should be raised each year. Well drained land is essential; partial shade during the summer is also desirable.

Radish

Radishes can be sown any time except May, June, and July, and by planting at intervals of one week a succession can be maintained. Take advantage of showery, genial weather to do the sowing. This crop makes a good companion crop for use with carrots as indicated under "Carrots." To have good tender radishes they must be liberally watered in dry weather, and quickly grown. They do best in a light rich soil, and in summer should be somewhat shaded.

Spinach

The seed should be planted in drills one foot apart in as rich soil as possible, covering about one-half inch deep. Advantage can be taken of the space between rows of tall beans and peas, the partial shade being of value in keeping it from going to seed too soon. The supply of moisture must be adequate; dry soil will force it into seeding very early.

The best season for Bloomsdale Savoy spinach is the cool winter months, planting being done in early November, though it can be grown with some success at other times. New Zealand spinach is more heat resistant than the Savoy spinach, but does not do well during the hottest months. Spinach Beet: see Swiss Chard.

Tomato

Tomatoes are easily grown if three cardinal principles are observed: These are: 1st, avoid starting the crop in rich soil; do not fertilize until the fruit begins to form; 2nd, give plenty of room to each plant; and 3rd, keep the roots well supplied with moisture by heavy watering when the fruit begins to form.

Too rich soil will cause excessive leaf and stalk growth and little if any fruit. Sunlight and air that reaches all parts of the plant is essential to the health of the plant. Otherwise the foliage will be mildewed and yellow and the blossoms will usually fall off without setting fruit. Lack of water will result in small fruits and not many of them. The removal of superfluous blossoms will result in the setting of a larger quantity of superior fruit.

Sow the seeds in flats or seed beds at any time. Set the plants in their permanent location, two feet apart each way, when they are four to six inches tall. Keep all but two or three branches near the top trimmed off and when these have reached the full length you desire nip off the terminal buds. It is essential that tomatoes be tied up closely to good stout stakes or trellises; otherwise a considerable part of the fruit will be lost by rotting after rains. If clusters of fruit seem in danger of breaking back, tie them up to the support also.

The tomato plant is attacked here by a blight which seems to remain in the soil from one season to the next. It is necessary, therefore, to plant tomatoes in a different location each year.

Turnip

Turnips to be tender and well flavored must be grown quickly, hence should have a rich soil and an open situation. The seed should be sown thinly in drills about a foot apart and thinned to one plant each four to six inches. The best time for the first planting is about the first of November. Plant every three weeks for a continuous supply. During the hot season make only very small plantings as the roots must be used before the plants go to seed, a condition brought on quickly by hot weather. During dry weather do not neglect to water them.

FLOWER GARDEN

The home flower garden is of very special charm in South China because it is possible to have some kind of flowers in bloom the whole year if proper care is taken in selecting those to be grown and the time of planting. In addition, relatively little is known of the varieties and cultural methods that will be most successful under our conditions, especially of the foreign flowers, and the thrill of the explorer and discoverer can be experienced in the care of the flower garden here more than in western countries where the possibilities are pretty well known. Because of this fact, of course, the possibility of disappointment is present also, but with the suggestions we make here it is hoped this danger will be materially reduced.

Raising Flowers from Seeds

Earthenware pots are best for raising seedlings, but if they prove too expensive, shallow boxes (about four to six inches deep) make a very good substitute if holes are drilled in the bottom and sides. Half fill the box with broken pots, stone, or any other good drainage material, and cover with about one and one-half to three inches of soil. A large mass of soil soon becomes sour. These boxes are also very useful for transplanting seedlings prior to setting out in the garden. Under no circumstances use tin or glazed pots as it is essential that the sides of the vessel be porous. Before sowing very choice or valuable seeds it is well to water the soil thoroughly and put the whole box or pan into a hot oven for an hour; the heat will kill all noxious insects and their eggs and the seeds of weeds.

For raising most seedlings a warm sunny corner of the garden should be chosen, close to a water supply and where specially drained beds can be prepared and utilized for nursery purposes. There should be room for the seed pans or boxes also. If the seed boxes are placed on a layer of coal

ashes the worms will to a large extent be prevented from working into and through the boxes. As seedlings require continual watering the drainage should be as perfect as possible and the soil of such consistency that if it becomes dry it will not readily cake; a light mulching of very fine, well-rotted manure will largely prevent this.

A good soil for sowing seeds consists of equal parts of dried pond mud, rotted manure, and sharp sand. In preparing the soil press it firmly, then sift some fine soil on the top, make quite even, give a good watering, and then sow the seeds. If the seeds are very small no soil will be needed to cover them; just press them firmly into the soil with a piece of flat board. If the seeds are of fair size sift on some more fine soil, and gently press down level. Allow about one-half inch of space between the soil and the top of the box or pan and cover with a sash of glass which will prevent rapid evaporation and maintain a more even temperature. Probably no more watering will be needed but if the soil shows signs of becoming dry sprinkle with a light spray of water, being careful not to wash away the seeds. A better practise is to dip the pans or box half their depth into water until the soil is well soaked to the surface.

As soon as the seeds are planted cover with papers or cloth to prevent the surface becoming burned and dry before the seedlings can take hold. It is just at this point that most amateurs fail. Once the germ is started in the seed it must continue to develop or die, and an hour's neglect to shade or water at this critical time will kill the seedling even before it appears above the surface of the soil. It must he remembered that while many flower seeds, especially the cheaper and commoner strains, are very hardy, other varieties, especially the "highly bred" strains are weak growers, and because it has been possible to grow a plentiful supply of pansies from a cheap packet, it does not follow that the seed of an exhibition strain

which fails under the same conditions is bad. The fancy strains are invariably weaker growers than the commoner sorts. Extraordinary vigor in flower seeds is usually a sign of a poor strain.

Marking Seed Beds

The name of the variety, and color of each kind of flowers, the date of planting, and height to which the plant grows should be marked on a bamboo label and stuck in the ground where the seeds are planted. Be sure to use a sun and rain-proof ink or pencil. This information will prove of value when transplanting time comes.

As soon as the seedlings show above the ground the shade should be removed, except during the hottest time of the day or on exceptionally bright days; so long as the plants are not damaged by excessive light and heat, and this is largely a matter of getting them used to it, the less shade they have the more vigorous the plants will be. Too much shading or too thick planting is undesirable as it "draws" the seedlings.

As soon as the young seedlings are large enough to handle, transplant two inches apart in the seed flats described above, but using much richer soil. The soil should be four inches deep in the flats. Water regularly to maintain rapid growth.

It is advisable to make a couple sowings from each packet of seeds. It is remarkable how often a second sowing is successful when the first has proven a failure.

Protection from the destructively heavy rains can be had by stretching wire netting over the boxes and covering this with light cotton cloth. This breaks the force of the rain drops and lets it through as a fine mist which will do no damage. Wire window netting is even better as it does not shut out so much light but it is more expensive. The screen used should let as much light and air through as possible.

Planting and Transplanting

When possible, choose a moist, calm, dull day for transplanting. Only lift a very few plants at a time from the seed bed as drying of the very fine roots gives them a serious check if it does not prove fatal. As a general rule, do not plant seedlings deeper than they were in the seed bed. After setting out according to a previously formulated plan be sure to water them to settle the earth around the roots.

Layering

Many plants, such as Carnations, Verbenas, and many shrubs are most easily propagated by "layering". This is usually done by fastening down the drooping branches, or shoots, to the ground and covering a portion of the stem with freshly dug earth, leaving only the tip of the branch above ground. Nearly all plants will readily root in this way and in a few months (in some cases in a few weeks) the new plant may be cut from the parent and moved. It is often advisable to cut the branch part way through on the under side, where it is pegged to the ground.

Cuttings

Most of the common garden perennials readily strike root from cuttings. The young shoots, as a rule, are the best to plant. The "wood" should not be too soft or too old and hard. They should be chosen with several good buds, and all the foliage except one or two small leaves should be removed with a sharp knife. Then plant in a pot of sharp sand and keep moist. If planted close to the edge of the pot so the ends touch the porous surface of the earthenware, the cuttings root more readily.

Special cultural directions

In the following pages we will give briefly some simple cultural instructions for the more common flowers that we know can be successfully grown here. Undoubtedly there are others, though less common, that can also be grown here; we have not attempted to be exhaustive.

FLOWER GARDEN CALENDER

SEEDS MAY BE SOWN:

January.— Aster, Chrysanthemum, Sunflower.

February.— Sunflower, Verbena, Zinnia.

March.— Amaranthus, Balsam, Cockscomb, Clitoria, Ipomea, Moonflower, Torenia, Zinnia.

April.— Amaranthus, Balsam, Cockscomb, Clitoria, Ipomea, Moonflower, Sunflower, Torenia.

May.— Amaranthus, Balsam, Cockscomb, Clitoria, Sunflower Torenia.

June.— Amaranthus, Balsam, Cockscomb, Ipomea, Moonflower, Sunflower, Torenia.

July.— Balsam, Cineraria, Celosia, Ipomea, Moonflower, Portulaca, Primula, Sunflower, Torenia.

August.— Balsam, Sunflower.

September.— Ageratum, Antirrhinum, Balsam, Begonia, Calendula, Candytuft, Canterbury Bells, Carnation, Cineraria, Coleus, Coreopsis, Cosmea, Canary Creeper, Convolvulus, Dahlia, Dianthus, Digitalis, Daisy, Foxgloves, Fresia, Fuchsia, Gaillardia, Geranium, Gloxinia, Godetia, Gypsophila, Heliotrope, Hollyhock, Larkspur, Lavender, Linaria, Love-lies-bleeding, Marigold, Mignonette, Mimulus, Nasturtium, Nemophila, Nicotiana, Pansy, Passion Flower, Petunia, Pink, Poppy, Portulaca, Phlox Drummondi, Primrose, Rose, Sunflower, Salpiglossis, Salvia, Schizanthus, Stock, Scabious, Sweet Peas, Sweet Alyssum, Verbena, Violet, Viola.

October:— Ageratum, Antirrhinum, Alyssum, Balsam, Begonia, Calendula, Candytuft, Canterbury Bells, Carnation, Cineraria, Coreopsis, Collinsia, Coleus, Calceolaria, Clarkia, Dahlia, Dianthus, Daisy, Delphinium, Foxgloves, Freesia, Gloxinia, Golden Feather, Godetia, Heliotrope, Hollyhock, Larkspur, Linaria, Love-lies-bleeding, Lobelia, Lupins, Marigold, Mignonette, Marguerite, Nicotiana, Nigella, Nemesia, Pansy, Petunia, Phlox Drummondi, Poppy, Stock, Sunflower, Sweet Alyssum, Sweet William, Sweet Peas, Verbena, Virginian Stock.

November:— Make a second sowing of any annual that has failed.

December:— Ageratum, Asters, Balsam, Clarkia, Chrysanthemum, Godetia, Lupins, Poppy, Pansy, Sunflower, Sweet Peas.

Ageratum

This is one of the easiest flowers to grow and its habit of growth makes it quite useful. There are two colors, blue and white, and the dwarf varieties if planted closely in rows of solid colors produce an interesting banded effect. Secure new seed from temperate countries each year as they rapidly degenerate in the tropics until they resemble a weed which is commonly found there. Plant in the fall in seed flats and transplant when large enough. They do fairly well in any garden soil.

Amaranthus

The splendid tints of crimson, scarlet, pink, yellow and bronze green in the foliage scarcely need flowers to enhance the ornamental effect of the plants. All the varieties grow freely in our climate and are quite effective when planted in masses. Sow where the plants are to remain, thinning to the proper distance while the seedlings are quite small. Seeds can

be planted any time during the growing season, though the spring months are usually recommended.

Antirrhinum (Snapdragons)

These are among the showiest of flowers for sunny borders. They are continuously in bloom, even in the driest and hottest situations where few other plants will live.

The seed which is planted in the fall is very easily raised. Avoid using as rich a soil or as much water as is required by most other plants. They are most effective where planted out twelve to eighteen inches apart in clumps or masses of distinct shades of color.

Asters

Asters have been only partially successful here and must be planted in December or January. The seed is nearly always weak in germinating and if it does not come up thickly it is not, necessarily because the seed is old. Transplant when large enough, to well-manured soil, spading twelve to eighteen inches apart. Do not neglect to water and mulch them every few days.

Balsam (Touch-Me-Not or Lady Slipper)

Balsam does especially well in tropical and sub-tropical countries. They are very succulent and require a very rich soil for their proper growth though they will do fairly well in poorer soils. Sow either in a seed bed or flat and plant out in clusters when three or four inches tall, or eighteen inches apart in rows fifteen inches apart. Set them in one or two inches deeper than they were in the seed bed. Regular watering and an abundance of light and air, and the absence of crowding are aids to good results. Balsam can be successfully grown at any season if the conditions mentioned above are provided.

Calendula (Pot Marigold)

The Pot Marigold includes two remarkably fine varieties, Orange King and Lemon Queen; the large flowers are double, perfectly formed and deserve a place among the choice subjects of any garden. Sow the seeds where the plants are to remain, later transplanting those removed in thinning. The plants should stand ten to fourteen inches apart, finally. They are fine, potted, for decorative purposes. Sow the seeds in the fall months.

Candytuft

This fragrant annual is quite easily grown. Sow the seeds in the fall where the plants are to remain, transplanting those removed in thinning. If desired, the seed can be sown in seed flats and the seedlings set out at their proper places. Avoid overcrowding at all times.

Calliopsis (Coreopsis)

The annual varieties of Calliops is thrive in Canton, furnishing a great number of graceful flowers for vases. The colors are various shades of yellow, brown, red and crimson, and the flowers are from two to four inches across. Sow the seed thinly in lines in the fall, using a good friable soil. When about three inches high transplant.

Canna

Cannas thrive under a hot, moist environment but can also be grown in colder climates, hence they are well adapted to our conditions. The seeds are very hard and to hasten germination they should be soaked in a bottle of water exposed to the sun for a few days or the seed coat should be filed through in a couple of places being careful not to injure the germ. Immediately upon preparing them in either way plant at regular distances in the bed if the temperature of soil and air is near 70 degrees Fahrenheit. The soil should be very rich and the water supply abundant.

Carnation

The carnation is not a difficult flower to grow if given care. The best soil is that of a rich loamy character, preferably a little heavy. Trench deeply and if not already rich in lime dig in some air-slaked lime or old plaster. Strictly avoid strong manures. Good drainage is necessary. Be sure the beds are in a sunny location and are well settled before the plants are set out.

Sow the seeds thinly, and transplant as soon as possible to prevent damping off. The plants should be twelve to eighteen inches apart in rows two feet apart. Do not plant deeper than the base of the first leaves. Once in about two weeks dust them well with air slaked lime when they are wet.

To have fine blooms it is necessary to stake them up and also to cut off the weaker flower stems. During the summer months mulch between the rows with well rotted stable manure to keep the soil cool and moist. Prevent the surface of the soil from baking. Destroy any diseased leaves with fire.

Celosia

All the Celosia, of which Cockscomb is one, thrive very well in our climate and the seed can be sown at any time. They can be grown either in pots or in the open.

Chrysanthemums

Perennial chrysanthemums are best propagated from cuttings or offsets, though very excellent ones can also be had from seed. The soil should be quite well supplied with manure, wood ashes and lime, but the lime must not be added at the same time as the manure. Sow the seed from September to January. When the seedlings are large enough to handle they should be pricked out about four inches apart. When about five inches tall, pot separately or plant out four feet apart.

Cuttings are selected from old plants, taking strong shoots about four inches long from healthy parents. Cut just below a bud with a sharp knife and remove the buds that go in the earth. Stick in very light sandy soil placing four or five cuttings in each five inch pot.

Placing the pots in sand in a box and covering with glass helps to force rooting. When the plants are well rooted, transplant each to a five-inch pot and again set in sand or ashes in the open, protected from very strong wind but where they get a fair amount of sun.

If they are to be grown in the open, trench and heavily manure the bed. When just dry enough not to cake, tread the bed down as hard as possible and set the plants out three feet apart, packing the soil about each plant as hard as possible. To secure fine blooms at least half of the buds will need to be removed. Occasional spraying with lime-sulphur will aid in keeping plants healthy.

Annual Chrysanthemums are easily grown from seed and offer a good number of color combinations. Pinch off some of the buds when they appear. Seed should be planted in the fall.

Clarkia

During the fall sow the seeds where the plants are to remain and thin to six inches apart. On rich soil give more space. Pinch off the terminal buds to make them branch.

Cosmos

Cosmos may be planted any time and will give a large number of blossoms though they are usually not so large as those in temperate climates. Avoid overcrowding and give liquid manure occasionally.

Delphinium (Larkspur)

Blue is the most uncommon color among flowers and several shades are found among the perennial varieties of delphinium. It is best to treat this plant as an annual, however, reseeding each year at the opening of the growing season. Either the annual or perennial sorts can be grown. The annuals have a greater variety of colors and shades. The germination is capricious, instances being known here at the College where the seed has lain in the ground nearly a year and has then proved its vitality.

Dianthus (Pinks)

Dianthus are easily grown from seed or cuttings. Seed should be planted in seed flats or beds in the fall. Although by cutting them back they will last a second season, we advise raising a fresh supply from seed each year; these seedlings are more vigorous than second year growths and give better results. Transplant, when large enough, ten to fourteen inches apart.

Helichrysum (Everlasting Flowers)

Helichrysum is easily grown from seed in any ordinary garden soil. Sow thinly in rows, on a finely pulverized bed, and later transplant. If cut before they are fully open they can be kept indefinitely without water.

Heliotrope

This long blooming favorite can be grown either from cuttings or seeds. If seed be used plant it in the fall months. As it is perennial it should be planted where it is to remain for several years; each year at the end of the dry season cutting it back to the ground. The first rains will bring it out with new vigor. Ridge up the beds about eight inches high for drainage.

Lupins

Lupins, with large spikes of sweet-pea-like blossoms, are among the most attractive and easily grown flowers. The whole culture consists of preparing the bed and sowing the seed in shallow drills. If they come up too thickly they can be easily transplanted.

Marigold

The marigolds are more tolerant of poor soils and drought than most flowers. They should have a sunny position and each plant a space of nine inches to two feet. Sow the seed in the fall.

Pot Marigolds-see "Calendula"

Mignonette

A limited success will be had with this flower by simply sowing the seed and giving no further attention. Much better results will be secured if a rich heavy soil is used and well tramped down, after digging, and before sowing the seeds. A cool position prolongs duration. Begin early to thin and never allow the leaves of two plants to touch; in good soil the plants will finally stand a foot or more apart. Plant in the fall.

Nasturtiums

Nasturtiums are among the few kinds of flowers that thrive in poor soils and under adverse conditions generally. Too rich soil produces foliage at the expense of flowers. Either dwarf or tall varieties can be grown here. Plant in the fall where they are to remain.

Pansies

The finest or Exhibition strains of pansies are not so hardy and easily grown as the cheaper sorts. Success with them depends upon careful attention to their needs but the results warrant the extra attention required.

Sow the seed of either sort in the fall months in boxes or pans of light soil; keep uniformly moist and stand in a cool shady place until the little plants are large enough to handle; always sow very thinly; if the plants are crowded they are liable to "damp off." Prick out into boxes two inches apart and keep well watered and in partial shade until they are to be planted out.

Plant out in a place shaded from noonday sun but away from trees. Keep constantly moist. The soil should be light and rich. Plants should be one foot apart in rows fifteen inches apart.

Phlox Drummondii

This is the annual phlox and includes all the primary colors in addition to white. Plant the seeds an inch apart in a seed bed and later, if they are too thick, prick out every other plant. Dwarf varieties should be planted ten inches apart and the tall ones eighteen inches apart.

Poppy

All the garden poppies are hardy and their culture is easy. It is necessary to avoid crowding, however, so sow the seeds thinly where they are to remain.

Escholtzias or California Poppy, and the Shirley are well known annual varieties that are self sowing after the first time. Orientals are perennials and are to be had in a great variety of color and shape.

Roses

If you have room for only a few flowers do not omit roses. Some splendid sorts can be had in China that furnish large quantities of very fine flowers with reasonable care.

Roses do well in almost any soil except that of a sandy nature; they prefer a deep, well drained heavy clay loam. If the soil is pure clay

add air slaked lime or sand to the rose bed. If very light, dig a trench two feet deep and fill with heavier soil. Once properly made the rose bed needs little further attention.

Have the bed in a well drained location, open to the sun and air. Do not mix roses with other shrubs, trees or flowers. Have a Rose Garden; it pays! The beds should usually be narrow so the flowers can be gathered and the plants attended to without tramping on the bed.

Shallow holes should be opened out of the prepared bed in which a forkful of well rotted manure can be placed and well mixed with the soil. Carefully spread out the roots as far as possible. After lightly covering the roots, tread around the plant to firm the soil, give a liberal watering, and fill to the level of the bed. Do not plant deeper than it was in the nursery bed.

Prune away only the broken parts when setting out. A year later cut back to two or three buds on each stem; this induces vigorous growth. The flowers the first year should not be cut; merely pull off the heads as they fade.

Roses are usually propagated from cuttings which are taken in the fall or winter months, each cutting being six inches long. "This year's" wood should be used, cutting the lower end off square about one eighth of an inch below a good bud. Plant the cuttings close together in a box of sand burying two-thirds of their length and setting the box in a dry, light location. Keep here till a callous has formed over the lower end of the stem and then set out immediately in a light, sandy loam with about one third of the length and at least one good bud above ground. Tread the earth down hard around the cutting.

Fungus diseases are controlled by the use of Lime-Sulphur; insects, by the use of tobacco and soap solution.

Sunflower

Sunflowers are to be had in a great variety of habits of growth. shape and shades of yellow. They prefer a heavily manured clay loam. Sow the seed any month in the year.

Sweet Peas

Undoubtedly the easiest grown and most magnificent annual flower for South China is the Early Flowering Sweet Pea. Complete disappointment will follow the use of any kind except the Early Flowering sort. so be sure you plant that kind. These can be had in constantly increasing colors and shades. For the average garden, mixed colors are most desireable, though solid colors of many kinds can be had.

Any open, well drained soil, will suit sweet peas, but for the best results the land should be trenched two feet deep two or three months before sowing the seed, if possible. They should be given an open sunny situation, with rows running north and south. A good dressing of cow or stable manure should be worked into the soil to the bottom of the trench, wood ashes being added also. If the soil is a tight clay a good dressing of lime worked into the soil a few months before preparing the seed bed would be very advantageous. On no account apply other fertilizers. A surface dressing of air-slaked lime while the sweet peas are growing helps to keep them free of disease and discourages slugs and snails. Drainage is absolutely essential.

Seed can be sown any time from September 1st to December. Really fine blooms are only produced on young plants and to get the best results over a long period of time, three sowings should be made. Sow three inches apart and later thin to six inches if the finest blooms are desired. An economical practise is to use paper pots, planting one seed in each. When the

plants are about three inches high set them out where they are to grow, tearing the pots as they are set in to enable the roots to spread out easily. When the plants are about five inches high supply some brushy support for the tendrils to hold to; later build the permanent trellis of six foot bamboos or other material.

Regular watering with a spray over the foliage each evening is essential. Blooms should be regularly picked as they appear.

Do not resow sweet peas on a given bed for three years after a crop has been grown, to avoid attacks of disease. Plant only healthy seed; shriveled, reddish brown seeds probably carry the spores of the Pea Spot. When the plants are a foot high and at monthly intervals spray the plants with Lime-Sulphur, one part in fifty of water, or with a solution of Potassium Permanganate of a deep wine color. Pull out and burn any unhealthy plants.

Verbenas

Verbenas may be propagated from self-rooted running stems, cuttings or seeds. The seed bed should be in a cool shady location protected from heavy rains. If sown thinly enough the plants remain in the seed bed until time to plant out. After planting out shade from hot sun for a few days.

Violet

Violets are most easily propagated from rooted runners, or divided roots, though they can also be grown from seed. Seed is slow to germinate, however, sometimes taking months to do so. Sow in September. They are fairly resistant to drought but should have enough water to keep them in good life. They do quite well in poor soil but light manuring is advantageous; avoid rich manuring as it forces leaf growth to excess. Set the plants out in a narrow bed so it is not necessary to tramp on the bed in gathering the flowers.

Zinnia

The zinnia is hardy in withstanding heat so should be planted in February and March for summer blooming. Transplant as soon as large enough as the older plants do not transplant well. Before planting out water the soil well and be careful in lifting the plants not to injure the roots; shade for a few days after setting out.

Ornamental and Forest Trees

The importance of shade trees and other ornamentals around the home or school grounds cannot be over emphasized in this land of long hot summers, and where there are few trees found growing of their own accord. Furthermore there is a great need, which is coming to be appreciated more each year, of reforesting the many bare hills of South China. It is with the hope of making possible the use of more trees under these circumstances that we are here including a few suggestions on the growing and care of trees. In a country where transportation is so slow and difficult commercial nurseries could be of only limited usefulness as the chances of nursery stock being successfully grown after a long trip would be rather slight. The trees grown in the home nursery have a much better chance of success.

In the following discussion we have in mind more especially the larger nursery where trees are grown in rather large numbers, but at the same time we have tried to make it applicable to the smaller home needs.

Selecting the site

The site of the nursery should be as near as possible to the area to to be planted, but at the same time a tract should be selected that is as level as possible. The soil should be rich and for most species a sandy loam is best. Do not select a site where the soil becomes waterlogged, as well

drained soil is essential. An adequate water supply for irrigation should be available. The site should also be sheltered from wind and the seed beds should be partially shaded, at least during the middle of the day when the sun is fiercest. Trees ought not to overhang the beds, however.

Plan

For the larger nursery, a square is the best shape as it is most economical of labor in the care required of it. The smaller one may be only a bed or two down one side of the garden. The area required depends upon the number of seedlings to be grown at any time, the kind of trees, and the size to which they are to be grown before transplanting. If they are to be transplanted once before setting out in the permanent location additional area will be necessary.

Fences

Nurseries are sometimes disturbed by animals that come in and destroy many trees. A fence to ward them off is necessary, especially where the nursery is remote from the habitation of men. A thick hedge of thorny bamboo will keep out all the larger animals, but some other protection will be necessary against small animals that would work through such a fence.

Preparation of the soil

All large stones, roots, stumps, etc., should be removed from the site and the soil should then be prepared much as for any kind of a garden. The beds should be only about three feet wide so that it is possible to weed and cultivate them without tramping the beds. The paths between as in the garden should be so designed as to act as drains in the rainy season and irrigation ditches in the dry season.

Irrigation

Beware of giving an excess of water. Many species will not germinate at all if the ground is very wet, and other species will be much slower to do so. A moderately moist condition is to be desired. Three ways of applying the water are used. One is to flood the seed beds for a couple hours as often as the soil dries. The second is to allow water to stand in the paths for twelve to twenty-four hours until the beds are thoroughly soaked by absorption. The third is to sprinkle the beds, using a water bucket or hose. Of these the latter two are best, and the two may both be used in the same nursery. The ground should be soaked before the seeds are planted and until such time as they are germinated and well established. A little overhead watering once or twice a day will be advantageous. After that they should be watered only at longer intervals as the ground becomes quite dry, in order that large rooting systems may be developed.

Sowing the seed

The seeds are usually sown across the bed is parallel rows, the width between depending upon the species of the tree and the size the seedlings are to attain before being moved. Very small seed should be covered very lightly, just enough to prevent their being easily washed or blown away. Larger seeds should be covered to a depth about equal to twice their diameter.

Some species which transplant with difficulty are sometimes sown in cheap baskets or pots so that the roots need not be disturbed in setting them out.

Some seeds are very slow germinating, taking a year or more to come up. To overcome this difficulty several means are used:

1. Store the seeds of some species for one year.
2. Soak hard-shelled seeds in warm water for about twenty four hours.
3. Pile in moist heaps until germination starts.
4. Scarify, i. e., file or cut through the hard coat using care not to injure the embryo.

The time to plant tree seeds is after the spring rains have started, usually in February or March.

Shading

The young seedlings as well as the seed beds must be protected from excessive sun, but alberal amount of air and light must be provided. A slat house made of bamboo laid closely together is most convenient as it is thereby possible to work in it out of the hot sun, but for the smaller nursery would not be economical. Frames made of split bamboo, that can be made secure about three feet above the beds, are the best for our conditions. The degree of shading can be controlled by the closeness of the bamboo. Straw can also be used in shading the beds.

Weeding

If the seeds have been planted in rows as directed above, the convenience in weeding will be much greater than if the seed were broadcast. Various types of hoes or weeders may be used, or hand weeding alone be practised. If the seedlings come up too thick in places they should be thinned out in the weeding process. Keep the beds clean.

Transplanting

If small seedlings are to be lifted, an ordinary garden trowel will be found convenient. Where possible a ball of earth should be taken with each seedling. If they are to be transplanted some distance they should be

placed in baskets of wet moss or grass as soon as they are raised. The drying of the fine roots is apt to be fatal. It is well to dip them in water or very weak liquid manure just before setting out again.

Larger sized seedlings will need to be dug with a shovel or similar tool. Here also the aim should be to take a ball of earth, the larger the better for the tree. If this is done, and the tree is to be transported any distance the ball should be well wrapped with a rope made of twisted straw which will prevent the ball being broken. In order to make a ball it will be necessary for the ground to be of the proper degree of moisture.

When trees are set out they should be planted just as deep as they were in the nursery. Tap roots must go straight down without being bent over. The hole in which the tree is set should be at least as big as necessary to let the side roots be spread out in their normal position. While making large holes is somewhat expensive in labor at the time, the expense will not be regretted when the improved growth of the trees is noted. This is especially important in the tight clay soils found in the vicinity of Canton. A good application of compost or rotted manure mixed with the dirt used in filling the hole will be a great help to the tree in getting established.

Pruning

The most desirable time to prune the tree that is to be transplanted is a couple days before digging it up. If it is not done at that time it should be done just after planting, when any broken parts should be cut off and enough of the other branches to keep the tree from transpiring too much until the roots are established. The amount of pruning required will be much less than otherwise if the trees are set out when they have no leaves.

Root Stock Cuttings.

Bamboo are usually propagated by removing pieces of the old clump

and setting them out in a new location, from January to the end of March. All the old stem except two or three nodes should be cut away. New shoots will come up from the root to form the new clump.

Stem Cuttings

After the rains have started in the spring, stem cuttings can be made of mulberry, banyan, eucalyptus, Bauhinia, Ligustrum, rubber and a few other kinds of trees. The cuttings should be taken before the buds begin to develop, excepting in the case of banyans which will root under almost any condition, stems as much as six inches in diameter taking root when set out as fence posts.

True hardwood cuttings should be selected from the current year's growth, each being about six to twelve inches long and about three-eighths to three-fourths of an inch in diameter with four to eight good buds. The plants should be dormant when the cuttings are taken. Cut the upper end at an angle and the lower end square about one-eighth of an inch from a good bud. Stick the cuttings in sandy but moist soil.

Tip layering is also possible with eucalyptus and a few similar trees. The process is described on page 39.

Air layering

Some trees are propagated by rooting branches while they are still attached to the parent tree. This is done by removing a ring of bark from a branch near the main stem, and then fastening a ball of earth around the the wound. This ball must be kept moist, which results in the layers being made during the cloudy, rainy season. If the weather is dry for a few days the balls will need to be watered often enough to keep them quite moist.

Fertilizing the nursery

No matter how rich the soil is to start with it will be necessary to fertilize it every few years. It will usually be advantageous to let it lie fallow for one or two years, and also to grow green manures on it which are later turned under. Compost or well rotted stable manure can also be used to advantage. The nursery is the safest place we know to use night soil and receive its full fertilizer value.

Collect native seeds

It is not necessary to buy seeds to start the nursery if plans are made far enough in advance and the seeds of the local trees are collected as they become ripe. After collecting they should be carefully dried in the shade and sealed in air tight containers until planting time.

Identifying trees

The Canton Christian College has a large and constantly increasing number of herbarium specimens of trees and other plants of this part of the world, all of which have been accurately identified by E. D. Merrill of the Philippine Bureau of Science. If you wish to identify your native trees send us a specimen of each, each specimen including twig, leaf, blossom and fruit if possible. Assign a number to each specimen and retain a duplicate specimen with the same number. Report to you will be by number.

Trees to grow

The trees listed below can be grown successfully from seeds in South China. Trials of other kinds are being made but we are not ready to recommend them. Others that grow all right are of minor importance so are not listed. Note in the table that "Distance Apart in the Row" is

the planting distance. When they begin to touch each other thin out the weak ones, so that there is about twice as much room for each tree. Those kinds marked "sow" should be planted in seed boxes and only very lightly covered.

Scientific Name	Common Name or Chinese Name	Depth to Plant Seeds	Distance Apart in Row.
Pterocarya stenoptera	Chinese Ash	1 in	3 in
Melia azedarach	China Berry (Sham Shu)	1½ „	4 „
Aleurites fordii	Wood Oil (Tung Yau)	2 „	5 „
„ triloba	Candlenut (Shek Lut)	2 „	5 „
Sapium sebiferum	Candleberry	1 „	3 „
Cinnamomum camphora	Camphor	1 „	2 „
Cunninghamia lanceolata	Fir	½ „	3 „
Albizzia sp.	Hop Fun	1 „	3 „
Wrightia pubescens	To Tiu Pat	1 „	3 „
Ficus retusa	Banyan (Yung Shu)	Sow	
Bauhinia variegata	Tsz King	½ in	3 „
Cassia glauca	Wong Wai	½ „	3 „
Grevillia robusta	Australian "Silk Oak"	Sow	
Ligustrum sinensis	Privet (Tsz Kap)	Sow	
Bombax ceiba	Cotton Tree (Muk Min)	Sow	
Sapindus mukorosii	Soapberry	1 in	3 „
Eucalyptus robusta	Eucalyptus (Yau Ka Lei)	Sow	
„ tereticornus	„ „ „	„ in	
Canarium album	White Chinese Olive (Pak Lam)	½ „	3 „
Pinus massoniana	Chinese pine	½ „	3 „
Acacia sp.	?	½ „	3 „
Poinciana regia	Royal Poinciana	1 „	3 „
Catalpa speciosa		½ „	2 „
Areca catechu var.	False Betel Nut Palm	¾ „	in pots
Livistonia chinensis	Large-leaf Fan Palm	¾ „	„ „
Caryota urens	Fish Tail Palm	¾ „	„ „
Cycas revoluta	Fung Mei Ts'o	¾ „	„ „

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